

CLAIMS

1. A method of controlling the displacements of a moving portion of a multi-axis robot along a path, the method being characterized in that it comprises the steps
- 5 consisting in:
- providing movement instructions (300) to a path generator (400), the instructions including at least information relating to the shape of the path (320) and to force setpoints (310);
 - 10 • calculating an external force signal (800) representing at least one component of the force (F) exerted by said moving portion (0) on its environment;
 - acting at a predetermined sampling frequency to provide said external force signal (800) to said path
 - 15 generator (400);
 - calculating, with said path generator (400) and at a predetermined sampling frequency, movement setpoints (500) along said path (320) in such a manner as to minimize the difference between the projection (F_T) of the
 - 20 external force onto the tangent (T) of the path and the projection of the setpoint onto said tangent; and
 - delivering said movement setpoints (500) to a servo-control means (601-606) enabling at least one axis of said robot (600) to be set into movement in compliance
 - 25 with said movement setpoints (500).
2. A method according to claim 1, characterized in that said external force signal (800) is calculated from information representing the current flowing in at least
- 30 one actuator (601-606) of said robot (600).
3. A method according to either preceding claim, characterized in that it includes a step consisting in using a dynamic model (712) of said robot (600) while
- 35 calculating said external force signal (800).

4. A method according to any preceding claim,
characterized in that it includes a step consisting in
supplying said path generator (400) with at least one
velocity limit value (330) and/or at least one
5 acceleration limit value (340) for taking into account
while calculating said movement setpoints (500), such
that said setpoints comply with said limit value(s).

5. Apparatus for controlling the displacements of a
10 moving portion of a multi-axis robot along a path, the
apparatus being characterized in that it comprises:

- a path generator (400) suitable for calculating
movement setpoints (500) as a function of movement
instructions (300) including at least information
15 relating to the shape of the path (320) and to its force
setpoints (310); and
- a force estimator (700) suitable for generating an
external force signal (800) representing at least one
component of the force (F) exerted by said moving portion
20 (O) on its environment and for delivering said signal to
said path generator at a predetermined sampling
frequency, where said path generator is suitable for
calculating said movement setpoints (500) along said path
(320) at a predetermined sampling frequency in such a
25 manner as to minimize the difference between the
projection (F_T) of the external force on the tangent (T)
to the path and the projection of the force setpoint onto
said tangent, said movement setpoints (500) being
delivered to a servo-control means (601-606) enabling at
30 least one axis of said robot (600) to be set into
movement.

6. Apparatus according to claim 5, characterized in that
it comprises program interpreter means (200) suitable for
35 executing programs containing movement instructions (300)
enabling at least the shape of the path (320) and force
setpoints (310) to be specified.